Natural Heritage & Endangered Species Program

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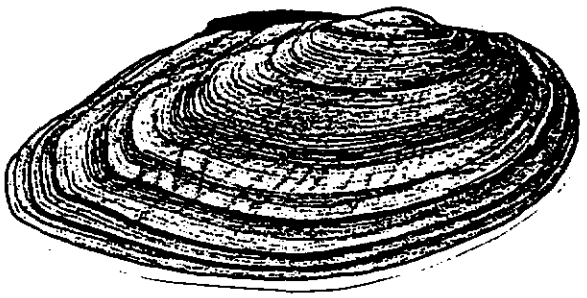
MASSACHUSETTS SPECIES OF SPECIAL CONCERN

EASTERN POND MUSSEL
Ligumia nasuta

DESCRIPTION: The eastern pond mussel is a medium to large sized freshwater mussel that measures approximately 100 mm (4 in) in length, 45 mm (1.8 in) high, and 25 mm (10 in) wide. The distinctive shell is somewhat elongate in shape with a narrowed pointed posterior. The outer covering (periostracum) of the shell is usually brown or blackish except in young individuals and in a few pond populations in which the shell is olive-green. In shells with a light periostracum, dark color rays extending across the shell are sometimes evident. Purple nacre (mother-of-pearl) is dominant in populations from the Atlantic drainage but rare in those from the Great Lakes drainage. Anterior and posterior hinge teeth are well developed. Adult male and female shells are different, with female shells showing a distinct bulge ventrally.



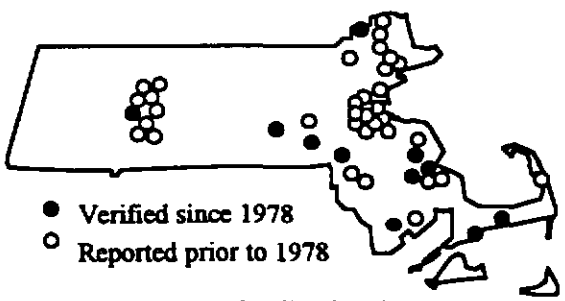
Burch, J.B. 1973. *Freshwater Unionacean Clams (Mollusca: Pelecypoda) of North America*. U.S. EPA.

SIMILAR SPECIES IN MASSACHUSETTS: By shape alone, the eastern pond mussel cannot be confused with any other species of freshwater mussel in the state.

RANGE: In Canada, the eastern pond mussel occurs only in Lake Ontario, Lake Erie, Lake St. Clair and their drainage basins. In the United States, this species occurs in those same lakes and drainage basins, from Michigan to New York, but also farther east to the Atlantic drainage in Massachusetts, and south in the Atlantic drainage to the Chowan, Roanoke, and Pamlico drainage basins in North Carolina.

HABITAT IN MASSACHUSETTS: The eastern pond mussel occurs in protected areas of lakes, in slackwater areas of rivers, and in canals. Sand, silty-sand, and to a lesser extent gravelly substrates in slow moving to standing water are the preferred habitats of this species. As is the case with other freshwater mussel species, stability of the substrate is important. The species is only rarely found in streams with a moderate current, but has been found to flourish below the falls of old, undisturbed impoundments.

Range of Eastern Pond Mussel



Massachusetts Distribution by Town
Eastern Pond Mussel

LIFECYCLE/BEHAVIOR: The eastern pond mussel is a long term breeder meaning that the female incubates the eggs and larvae in the marsupial portion of the outer gill (demibranch) for almost a year. Eggs are deposited into the demibranches in summer where they develop over the ensuing period into larvae called glochidia. The following spring the glochidia are released. Glochidia are parasitic on specific species of fish; however, the species of fish involved with the eastern pond mussel remains unknown. The fish carries the parasite on its gills until it transforms into a juvenile mussel at which time it drops off the fish to commence a benthic existence.

POPULATION STATUS IN MASSACHUSETTS: The eastern pond mussel is presently listed as a **Species of Special Concern** in Massachusetts. After several years of intensive surveying, there are currently 21 populations known from 18 towns. An additional 37 populations recorded in museum collections from 35 towns were not able to be reverified. (Some towns have both current and historical-only records.) At present, the eastern pond mussel is known from a number of localities in Massachusetts near the coast, on Cape Cod, and the lower Connecticut River system. However, some historically known populations are no longer extant and, in particular, the Connecticut River populations have declined considerably.

MANAGEMENT RECOMMENDATIONS: Habitat alteration or destruction are currently the most important threats to the eastern pond mussel's existence in Massachusetts. Organic pollution produced by residences abutting the aquatic habitat containing this species constitutes a threat, as does runoff containing crankcase oil, solvents, insecticides, etc. Increased acidification of freshwaters poses additional problems for the species. This species is habitat sensitive and its population is threatened by the effects of acid rain not only damaging the mussel's tissues but by harming its required host fish. Research shows that there is gill damage to the host fish from acid rain. These results have a definite impact on glochidia which prefer fish gills as sites for parasitism. When this parasitic stage is lost or altered, it will result in the death of the freshwater mussel glochidia and therefore diminish the viability of population reproduction. Glacial soils in the habitat areas of this species lack buffering capabilities that would shield it from the deadly effects of acid rain. In effect, if "the host fish goes, so goes the freshwater mussel population"(Wright).

CC, PCS 1998 update

Further Reading

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Fichtel, C. and D. G. Smith. 1995. The Freshwater Mussels of Vermont. Nongame and Natural Heritage Program, Vermont Fish and Wildlife Department. Tech. Rpt. 18. Montpelier, VT. 54pp.

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Martin, S.M. 1997. Freshwater Mussels (Bivalva: Unionoida) of Maine. Mortheastern Naturalist 4(1):1-34.